IDEM Office of Air Quality November 2009

(800) 451-6027 www.in.gov/idem/4654.htm

2009 Ozone Season Summary Report

Purpose

This ozone season summary provides an overview of ozone levels from the 2009 monitoring season and ozone trends over the last ten years. Prior to 2008, the Indiana Department of Environmental Management (IDEM) monitored ozone levels under the 8-hour ozone standard which was established in July 1997 by the U.S. Environmental Protection Agency (U.S. EPA). The 1997 8-hour ozone standard was 0.08 parts per million (ppm), with values below 0.085 ppm meeting the standard and values equal to or greater than 0.085 ppm, exceeding the standard. On March 12, 2008, the U.S. EPA significantly strengthened the 8-hour ozone standard to a level of 0.075 ppm in order to be more protective of public health. Starting in 2008, an area violates the standard when the *design value,* which is the three-year average of the fourth highest value for each ozone season, is equal to or greater than 0.076 ppm. On September 16, 2009, the U.S. EPA announced it would review the 2008 revision to the 8-hour ozone standard for ozone to ensure it is sufficiently protective of public health. The U.S. EPA will issue a final decision concerning the standard by August 2010.

Indiana monitors ozone in areas where levels are expected to be higher because of population density, motor vehicle and industrial activities. IDEM collected and reported data from 41 ozone monitors across Indiana in 2009. An ozone monitor was added to the Indianapolis-Washington Park site in May of 2009.

Ozone Designations and Redesignations

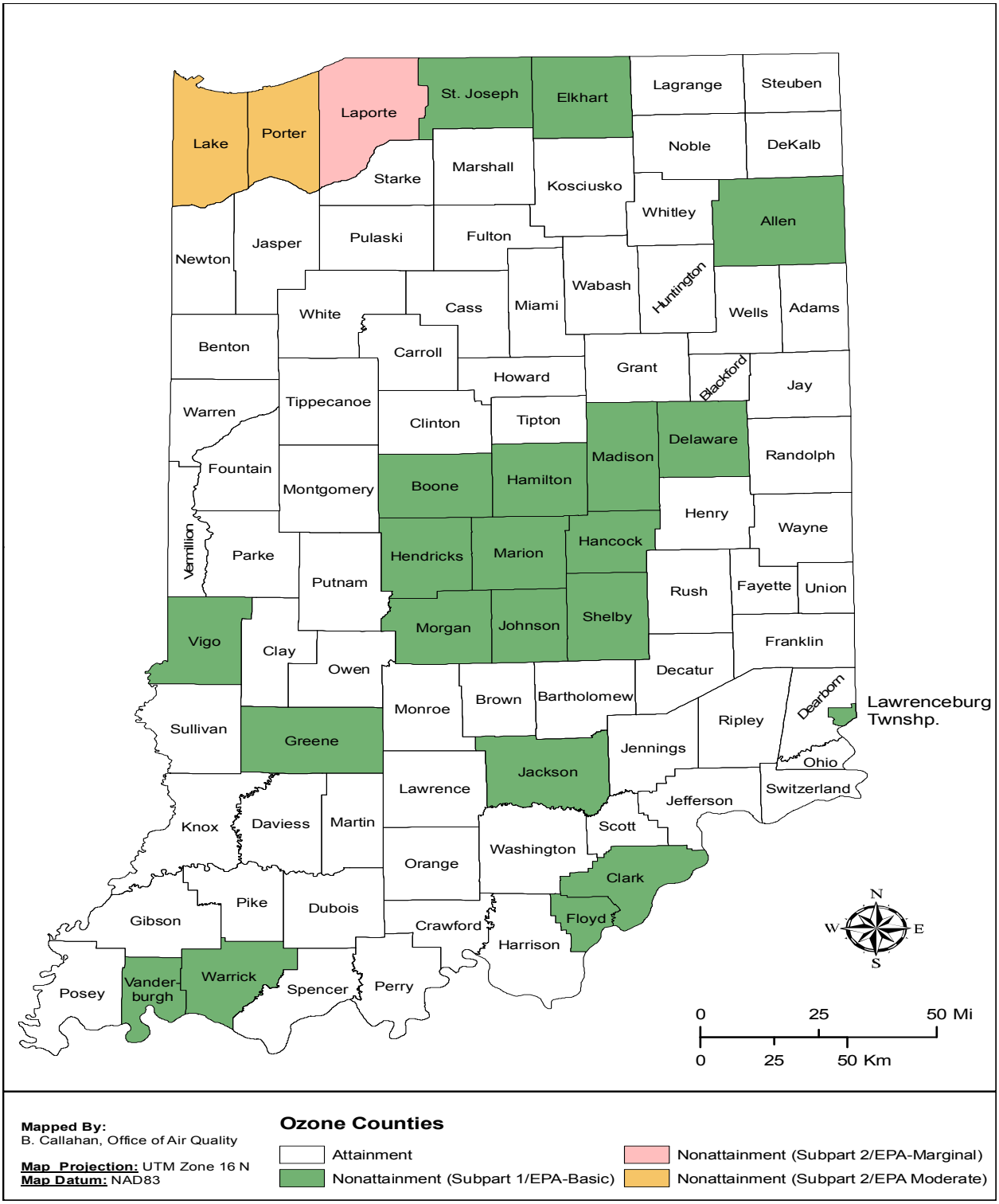
On April 15, 2004, the U.S. EPA designated areas under the new 8-hour ozone health standard of 0.08 ppm and classified them as attainment, nonattainment or unclassifiable based on data collected from 2001-2003. In its initial announcement, 23 counties and one township in Indiana were identified as being in violation of the new 8-hour standard. At the close of the 2007 ozone season, only one monitor recorded a three-year design value above the standard. At the close of the 2008 ozone season, all 40 ozone monitors had a three-year design value which met the standard.

Lake and Porter counties and Lawrenceburg Township in Dearborn County, are the only areas that were designated nonattainment in 2004, that are yet to be redesignated to attainment by the U.S. EPA. A final redesignation and maintenance plan was submitted by IDEM to the U.S. EPA for Lake and Porter counties in June 2009 and the U.S. EPA is processing this request with proposed redesignation expected by the end of 2009. Lawrenceburg Township is designated nonattainment along with the Cincinnati metropolitan area. This area attained the standard at the close of 2009 ozone season. IDEM has prepared a redesignation petition and maintenance plan for Indiana's portion of the Cincinnati area, with a final submission to be made in early 2010. IDEM expects U.S. EPA to finalize redesignation of these two remaining areas prior to the start of the 2010 ozone season.

On March 12, 2009, IDEM submitted state recommendations to the U.S. EPA for attainment, nonattainment, and unclassifiable areas for the revised 8-hour standard of 0.075 ppm. Should the U.S. EPA find the 2008 revision to the National Ambient Air Quality Standard's insufficient to protect public health and the environment, the standard will once again be revised. Final designations would be made in August 2011. For more information regarding the ozone designation process, or Indiana's redesignation petitions and maintenance plans, visit www.in.gov/idem/4654.htm or contact Sarah Raymond of the Office of Air Quality at (800) 451-6027 or (317) 232-8449.

2004 8-Hour Ozone Designations

The map below shows the nonattainment designations that U.S. EPA made in April 2004. Twenty-three full counties and one partial county, Lawrenceburg Township in Dearborn County, were designated as nonattainment of the 8-hour ozone standard. That means those areas had a three-year (2001-2003) design value for ozone which was equal to or greater than 0.085 parts per million.



Mapped By:
B. Callahan, Office of Air Quality

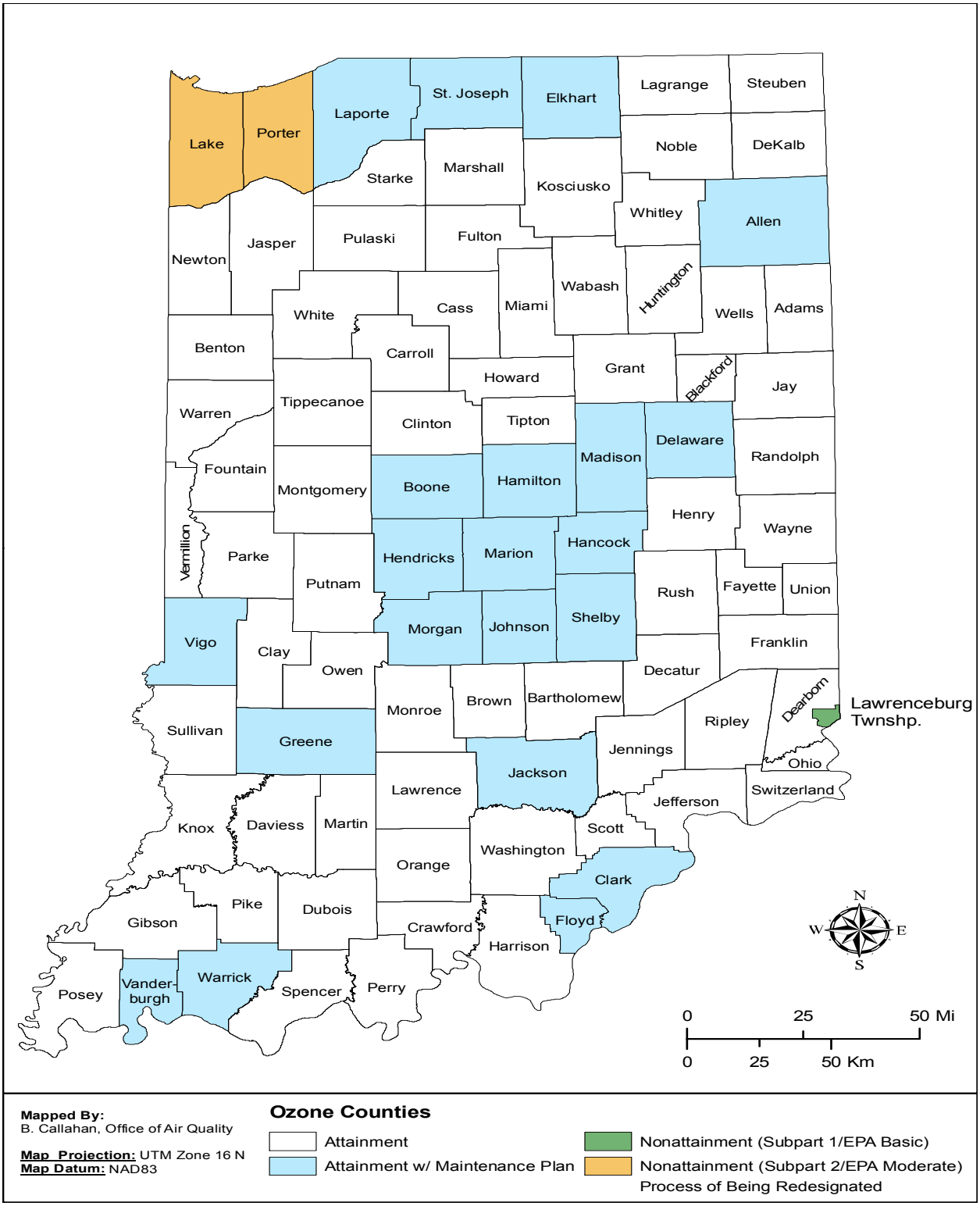
Map Projection: UTM Zone 16 N
Map Datum: NAD83

Ozone Counties

- Attainment
- Nonattainment (Subpart 1/EPA-Basic)
- Nonattainment (Subpart 2/EPA-Marginal)
- Nonattainment (Subpart 2/EPA Moderate)

2009 8-Hour Ozone Status

The map shows the designation status of the counties in Indiana for the start of the 2009 ozone season based on the 1997 8-hour standard (0.08 ppm). Lawrenceburg Township in Dearborn County is part of the Cincinnati nonattainment area and became eligible for redesignation at the close of the 2009 ozone season. IDEM is in the process of preparing a Redesignation Petition and Maintenance Plan for Lawrenceburg Township to submit to U.S. EPA. IDEM's redesignation request for Lake and Porter counties is still pending U.S. EPA approval.



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B. Callahan, Office of Air Quality

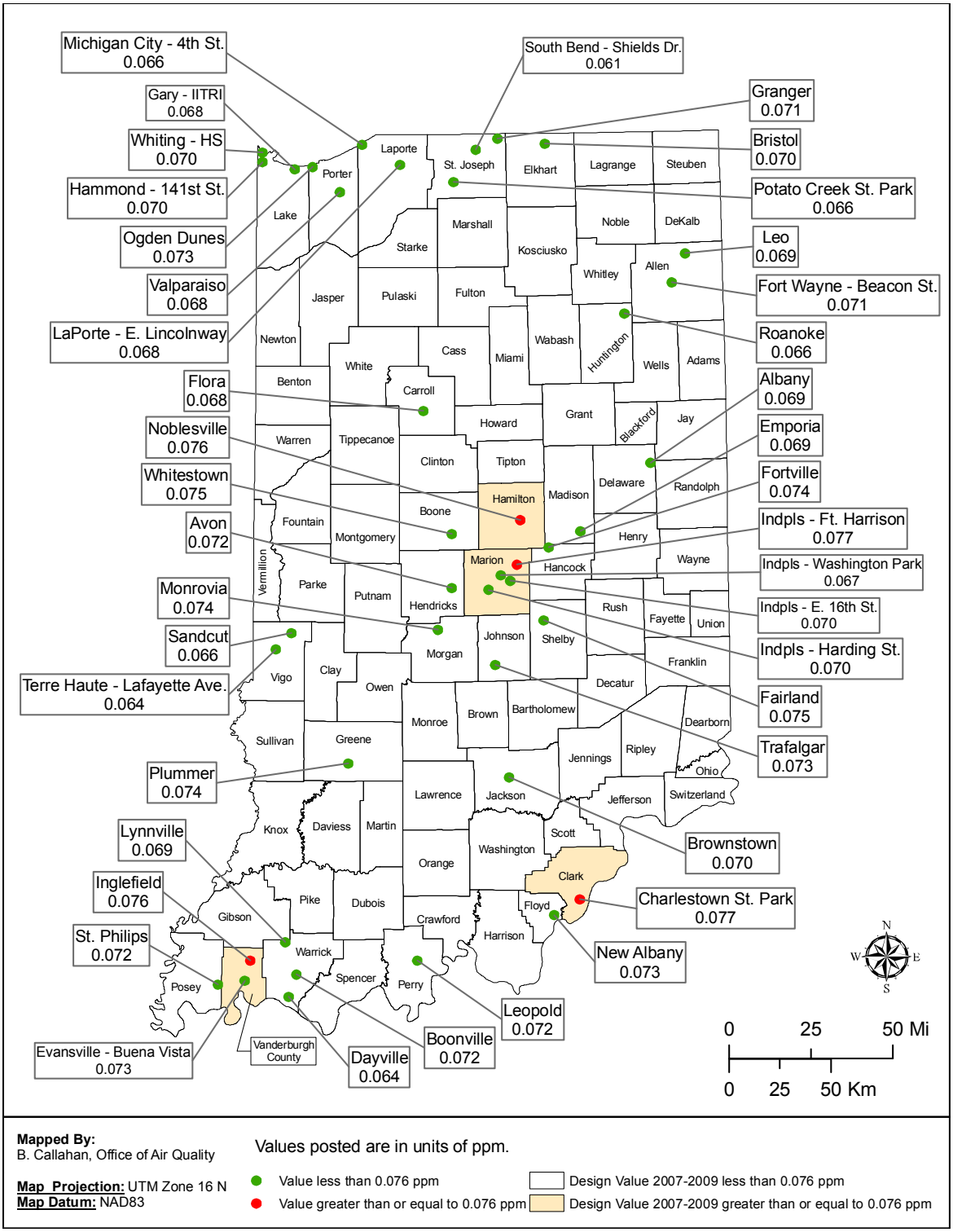
Map Projection: UTM Zone 16 N
Map Datum: NAD83

Ozone Counties

- Attainment
- Attainment w/ Maintenance Plan
- Nonattainment (Subpart 1/EPA Basic)
- Nonattainment (Subpart 2/EPA Moderate)
  Process of Being Redesignated

2008– 8-Hour Ozone Status

On March 12, 2008, the U.S. EPA revised the 8-hour ozone standard to a level of 0.075 ppm. The map shows the current designation status compared to the new standard for the counties in Indiana based on 2007-2009 monitoring data. IDEM submitted designation recommendations on March 11, 2009, based on 2006-2008 monitoring data. Designation recommendations will mostly likely be finalized in 2010 using 2007-2009 monitoring data.



Mapped By:
B. Callahan, Office of Air Quality

Map Projection: UTM Zone 16 N
Map Datum: NAD83

Values posted are in units of ppm.

- Value less than 0.076 ppm
- Value greater than or equal to 0.076 ppm
- Design Value 2007-2009 less than 0.076 ppm
- Design Value 2007-2009 greater than or equal to 0.076 ppm

Ozone Monitoring

U.S. EPA provides guidelines for the placement of ambient air quality monitors. Ozone monitors are placed based on the population density and manufacturing levels in an area since ozone levels are expected to be higher in those areas. In 2009, there were 41 ozone monitors located throughout the state from which IDEM collected data.

Ozone levels are monitored 24 hours per day and rolling 8-hour averages are calculated. The highest 8-hour average is what is reported for the day.

A monitor's design value is calculated at the end of the ozone season using the fourth highest value from the current year and the preceding two years to get a three-year average. This is the design value that U.S. EPA uses to determine if an area is above or below the standard.

For example, the 2007-2009 design value shown on the table below is the average of the 4th high values for 2007, 2008, and 2009. Design values have been calculated for each monitor in the state.

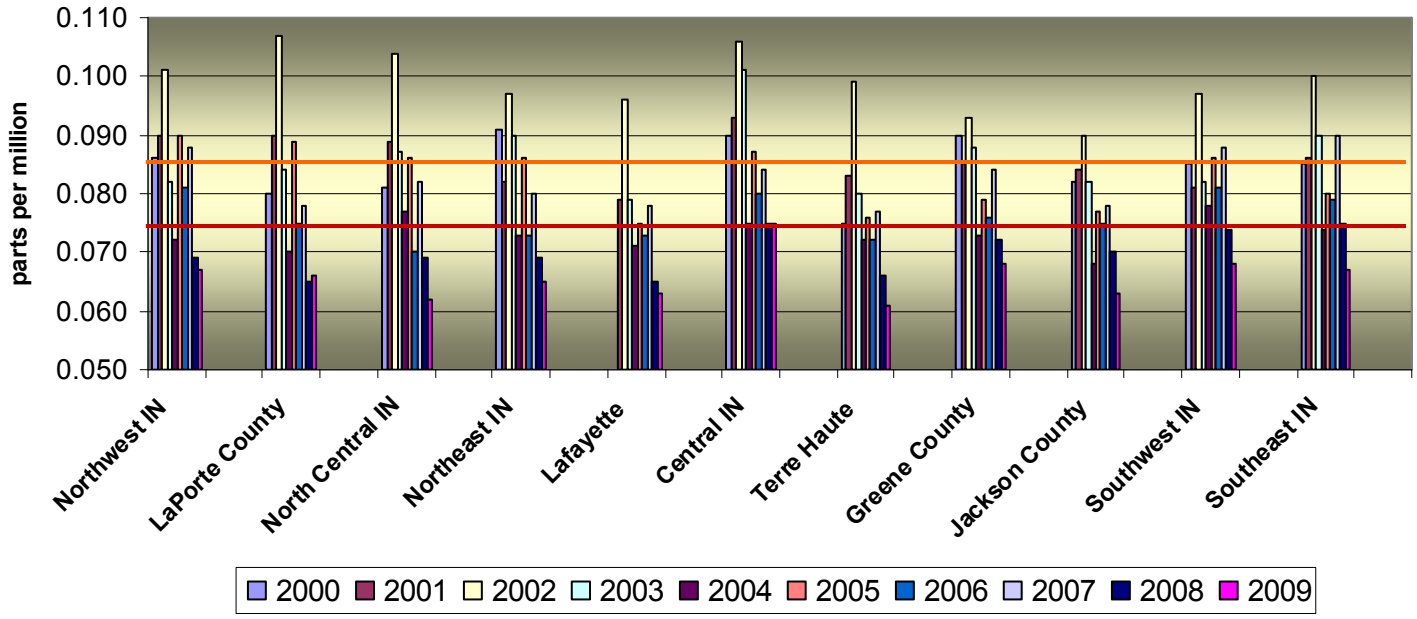
At the close of the 2009 ozone season, no ozone monitors across Indiana recorded a 4th high value equal to or above the 1997 8-hour standard and no monitors had a three-year design value that exceeded the 1997 8-hour ozone standard. No monitors in areas that have a maintenance plan had an exceedance or violation of the 1997 8-hour ozone standard.

2007-2009 Fourth High Ozone Values and 2007-2009 Design Values (ppm)

County	Site	2007 4th High	2008 4th High	2009 4th High	2007-2009 Design Value	County	Site	2007 4th High	2008 4th High	2009 4th High	2007-2009 Design Value
Allen	Leo	0.077	0.066	0.065	0.069	Marion	Mann Rd.	0.08	Site Discontinued 12/31/07		
Allen	Ft. Wayne	0.08	0.069	0.065	0.071	Marion	Ft. Harrison	0.083	0.075	0.073	0.077
Boone	Whitestown	0.083	0.073	0.069	0.075	Marion	Harding St.	0.076	0.067	0.067	0.070
Carroll	Flora	0.078	0.065	0.063	0.068	Marion	E. 16th St.	0.08	0.066	0.065	0.070
Clark	Charlestown State Park	0.09	0.075	0.067	0.077	Marion	Washington Park	Site Began 6-May-2009		0.067	0.067
Delaware	Albany	0.079	0.062	0.068	0.069	Morgan	Monrovia	0.084	0.069	0.069	0.074
Elkhart	Bristol	0.082	0.068	0.061	0.07	Perry	Leopold	0.08	0.073	0.065	0.072
Floyd	New Albany	0.082	0.075	0.063	0.073	Porter	Odgen Dunes	0.084	0.069	0.067	0.073
Greene	Plummer	0.084	0.072	0.068	0.074	Porter	Valparaiso	0.08	0.061	0.064	0.068
Hamilton	Noblesville	0.084	0.073	0.071	0.076	Posey	St. Phillips	0.08	0.069	0.067	0.072
Hancock	Fortville	0.081	0.074	0.068	0.074	St. Joseph	Potato Creek	0.075	0.063	0.06	0.066
Hendricks	Avon	0.079	0.068	0.07	0.072	St. Joseph	Granger	0.082	0.069	0.062	0.071
Huntington	Roanoke	0.078	0.06	0.062	0.066	St. Joseph	South Bend	0.067	0.058	0.059	0.061
Jackson	Brownstown	0.078	0.07	0.063	0.07	Shelby	Fairland	0.082	0.07	0.075	0.075
Johnson	Trafalgar	0.08	0.069	0.071	0.073	Vanderburgh	Evansville	0.085	0.074	0.061	0.073
Lake	Gary IITRI	0.085	0.062	0.058	0.068	Vanderburgh	Inglefield	0.088	0.072	0.068	0.076
Lake	Whiting	0.088	0.062	0.062	0.07	Vigo	Terre Haute	0.077	0.059	0.058	0.064
Lake	Hammond	0.077	0.068	0.065	0.07	Vigo	Sandcut	0.073	0.066	0.061	0.066
LaPorte	Michigan City	0.073	0.059	0.066	0.066	Warrick	Boonville	0.083	0.071	0.064	0.072
LaPorte	LaPorte	0.078	0.065	0.063	0.068	Warrick	Lynnville	0.08	0.064	0.064	0.069
Madison	Emporia	0.078	0.065	0.064	0.069	Warrick	Dayville	0.076	0.06	0.057	0.064

Prior to 2008, red numbers are equal to or greater than 0.085 ppm. In 2008 and 2009, red numbers are equal to or greater than 0.076 ppm.

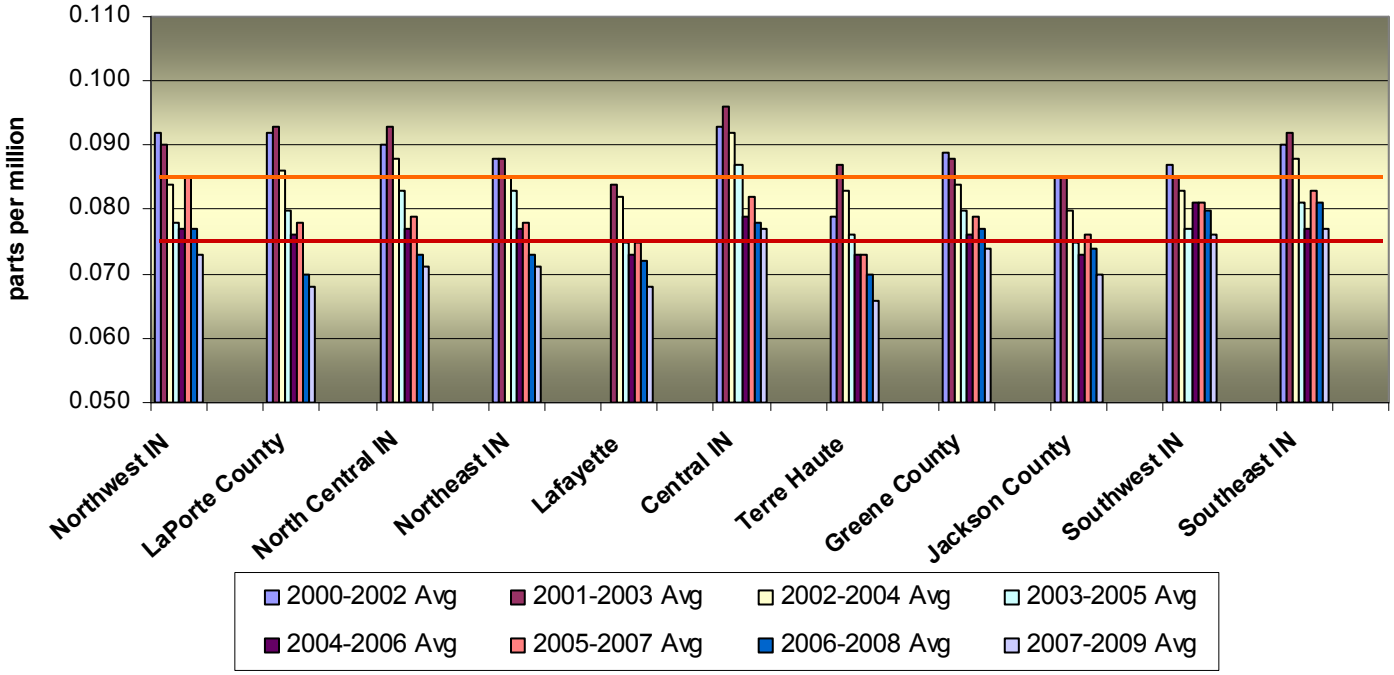
4th Highest Ozone Values by Region (2000-2009)



An Exceedance versus a Violation of the Standard

An exceedance occurs when an 8-hour average value is measured above the standard. A violation occurs when the three-year average of the fourth highest value for the ozone season exceeds the standard. A monitor can exceed the standard without being in violation.

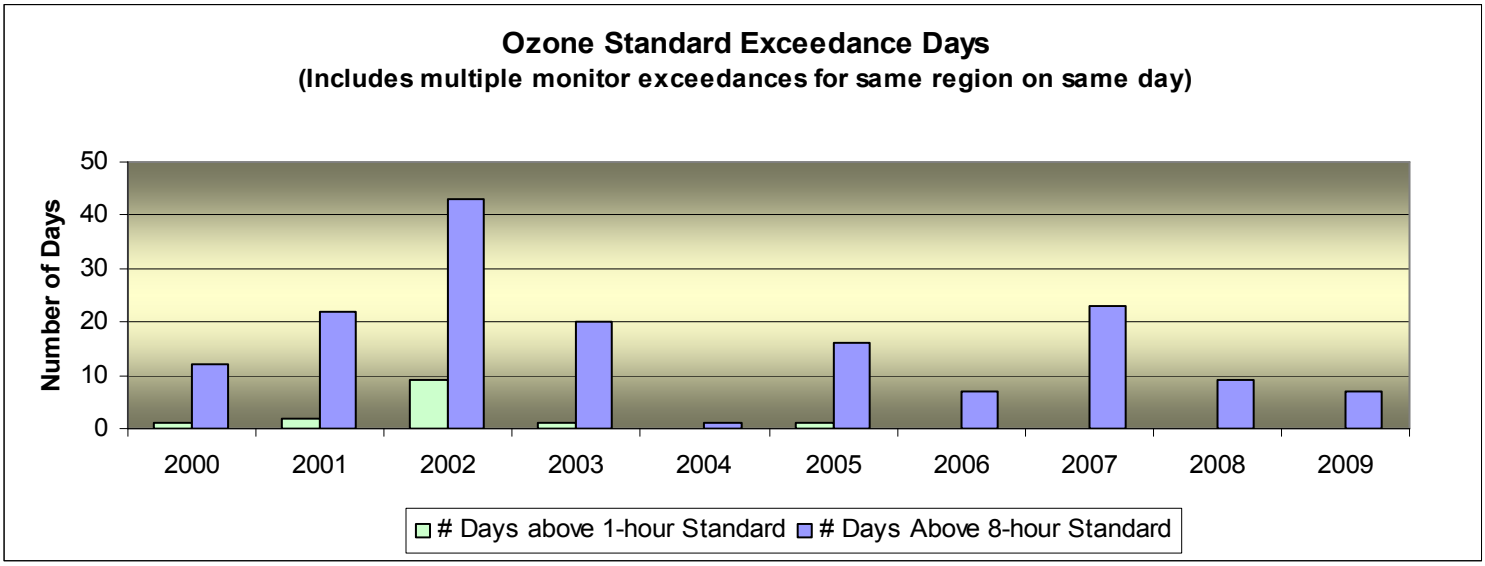
3-Year Ozone Design Value by Region (2000-2009)



1997 8-hour Ozone Standard
2008 8-hour Ozone Standard

Ozone Standard Exceedance Days

The 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005. However, for the sake of information, the 1-hour standard is still included in this graph. There has been no exceedances of the 1-hour standard since 2005. Days above the 8-hour standard prior to 2008 are equal to or greater than 0.085 ppm. Days above the 8-hour standard in 2008 and 2009 are equal to or greater than 0.076 ppm.



Total Days of 8-Hour Ozone Exceedances by Monitor 2000-2009

County	Location	00	01	02	03	04	05	06	07	08	09	County	Location	00	01	02	03	04	05	06	07	08	09
Allen	Leo	4	2	13	4	0	8	0	0	0	0	Marion	Fort Harrison	3	6	12	5	0	1	0	1	2	2
Allen	Fort Wayne	1	0	14	3	0	0	0	1	0	0	Marion	Harding Street	3	3	12	2	0	1	0	0	0	0
Boone	Whitestown	2	3	12	5	1	1	1	1	0	0	Marion	Mann Road	2	0	11	2	0	0	0	1		
Carroll	Flora		1	10	2	0	0	0	1	0	0	Marion	East 16th Street	2	2	15	3	0	0	0	0	0	0
Clark	Charlestown	4	4	15	4	0	3	3	8	3	0	Marion	Washington Park										0
Delaware	Albany		3	11	5	0	2	0	2	0	0	Morgan	Monrovia	5	2	13	2	0	0	0	2	1	1
Elkhart	Bristol			18	4	0	5	0	1	0	0	Perry	Leopold					0	4	0	3	2	1
Floyd	New Albany	0	0	11	4	0	2	1	3	3	0	Porter	Ogden Dunes	4	4	12	1	0	7	0	3	1	0
Greene	Plummer	4	5	14	4	0	0	0	3	0	0	Porter	Valparaiso	3	0	16	2	0	2	0	0	0	1
Hamilton	Noblesville	4	4	19	5	0	4	1	2	3	0	Posey	St. Phillips	5	0	13	1	0	1	0	0	1	1
Hancock	Fortville	4	8	18	6	0	1	0	1	2	1	Shelby	Fairland	4	6	13	4	0	0	0	1	0	3
Hendricks	Avon	4	3	10	2	0	0	0	0	0	1	St. Joseph	Granger	1	6	22	5	1	6	0	2	0	0
Huntington	Roanoke	4	1	10	3	0	0	0	0	0	0	St. Joseph	Potato Creek	1	2	16	1	0	0	0	0	0	0
Jackson	Brownstown	3	1	8	0	0	0	0	0	1	1	St. Joseph	South Bend	3	3	16	1	1	2	0	0	0	0
Johnson	Trafalgar	3	2	13	2	0	1	0	2	1	1	Vanderburgh	Evansville	1	0	16	2	0	1	1	4	2	0
Lake	Gary IITRI	1	3	7	0	0	7	0	4	1	0	Vanderburgh	Inglefield	0	0	5	1	0	0	2	8	1	1
Lake	Hammond	4	8	18	2	0	5	0	1	0	1	Vigo	Sandcut		2	9	2	0	1	0	0	0	0
Lake	Whiting					0	4	2	5	0	0	Vigo	Terre Haute	1	2	2	0	0	0	0	1	0	0
LaPorte	LaPorte	3	0	15	3	0	4	0	1	0	1	Warrick	Boonville	0	1	12	2	0	2	2	1	0	0
LaPorte	Michigan City	3	8	16	2	0	3	0	0	0	1	Warrick	Dayville						0	0	0	0	0
Madison	Emporia	1	5	17	8	0	1	0	1	0	0	Warrick	Lynnville	0	1	11	2	0	0	0	0	1	0
												Warrick	Yankeetown	0	1	17	2	0					

Days above the 8-hour standard prior to 2008 are equal to or greater than 0.085 ppm.
In 2008, days above the 8-hour standard are equal to or greater than 0.076 ppm.

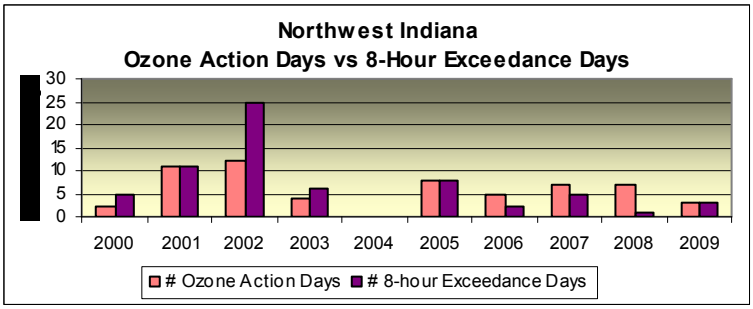
Indicates monitor was not in operation that year.

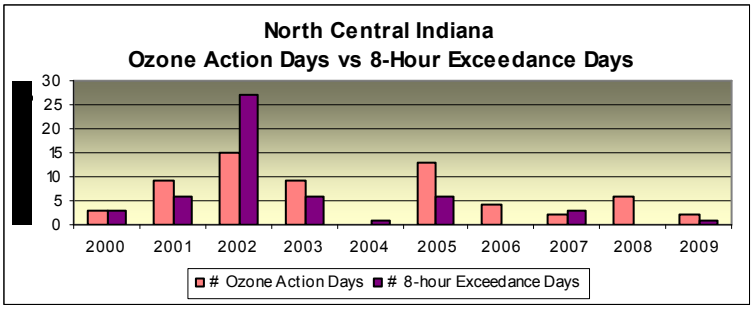
Number of Ozone Action Days 2000-2009

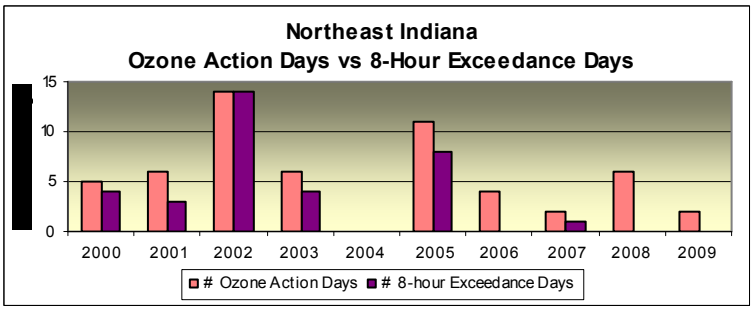
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Northwest Indiana	2	11	12	4	0	8	5	7	7	3
North Central Indiana	3	9	15	9	0	13	4	2	6	2
Northeast Indiana	5	6	14	6	0	11	4	2	6	2
Central Indi-ana	2	7	12	7	0	9	3	13	9	3
West Central Indiana	2	0	0	0	0	6	2	7	2	0
Southwest Indiana	1	3	11	3	0	8	9	21	9	2
Southeast Indiana	6	5	12	5	1	8	8	25	12	4

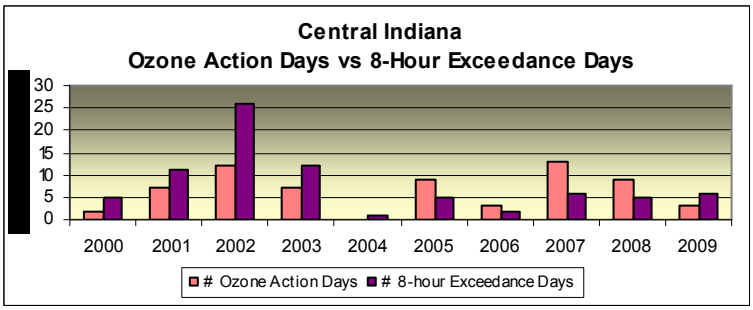
Number of 8-Hour Exceedance Days 2000-2009

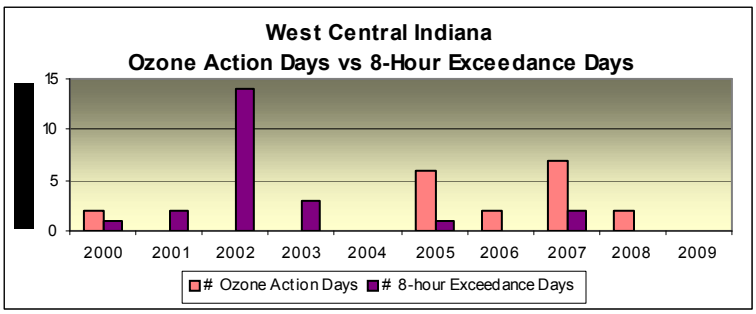
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Northwest Indiana	5	11	25	6	0	8	2	5	1	3
North Central Indiana	3	6	27	6	1	6	0	3	0	1
Northeast Indiana	4	3	14	4	0	8	0	1	0	0
Central Indiana	5	11	26	12	1	5	2	6	1	6
West Central Indiana	1	2	14	3	0	1	0	2	0	0
Southwest Indiana	8	6	21	6	0	4	2	12	0	1
Southeast Indiana	5	5	21	5	0	3	3	9	1	1

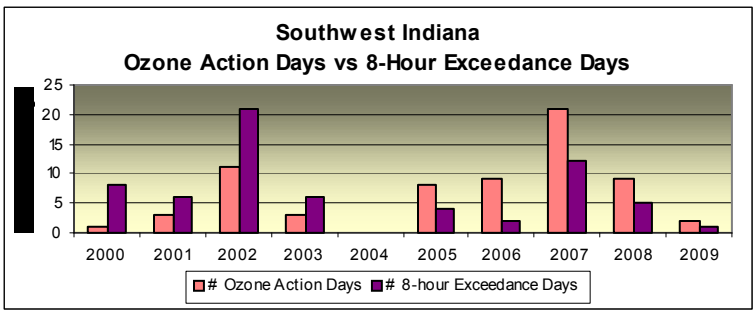


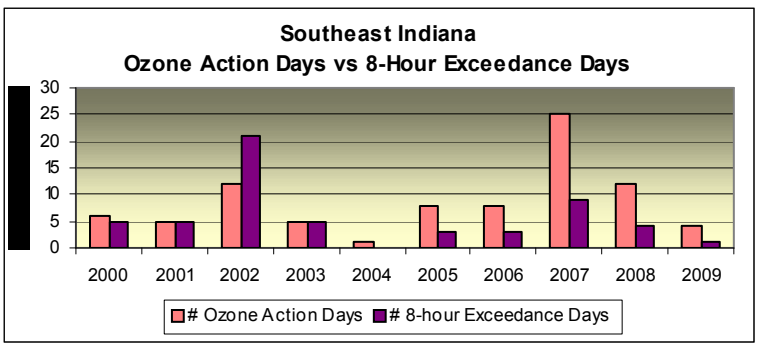












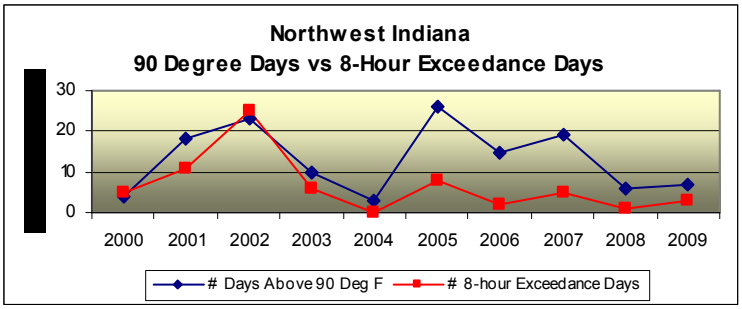
Ozone Monitors by Area of the State	
Area	**Counties**
Northwest	Lake, LaPorte, Porter
North Central	Elkhart, St. Joseph
Northeast	Allen, Huntington
Central	Boone, Delaware, Hamilton, Hancock, Hendricks, Johnson, Madison, Marion, Morgan, Shelby
West Central	Carroll, Vigo
Southwest	Greene, Perry, Posey, Vanderburgh, Warrick
Southeast	Clark, Jackson, Floyd

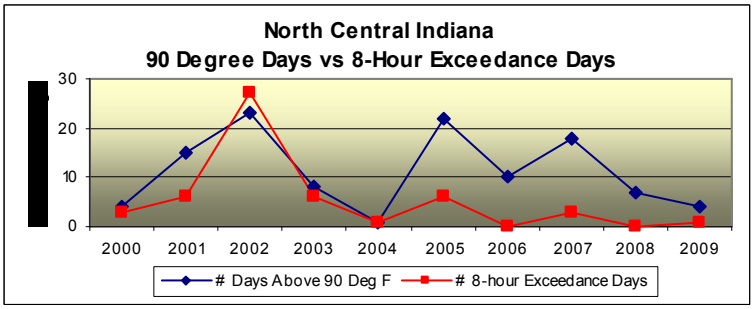
Number of 90 Degree Days *2000-2009

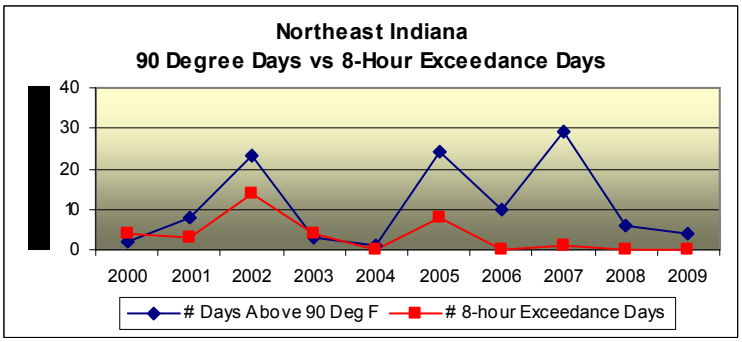
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Northwest Indiana	4	18	23	10	3	26	15	19	6	7
North Central Indiana	4	15	23	8	1	22	10	18	7	4
Northeast Indiana	2	8	23	3	1	24	10	29	6	4
Central Indiana	5	11	36	6	0	21	10	35	6	8
West Central Indiana	5	11	36	6	0	58	42	28	7	10
Southwest Indiana	22	30	56	23	9	46	32	58	36	24
Southeast Indiana	14	21	40	15	19	50	31	64	48	13

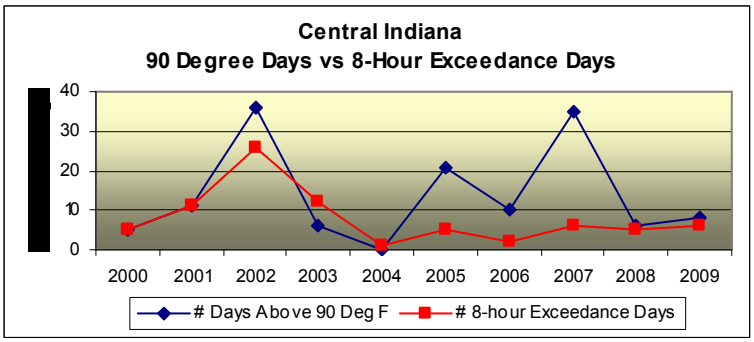
Number of 8-Hour Exceedance Days 2000-2009

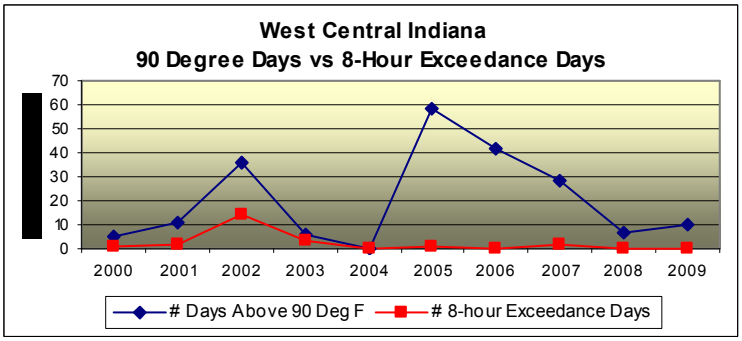
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Northwest Indiana	5	11	25	6	0	8	2	5	1	3
North Central Indiana	3	6	27	6	1	6	0	3	0	1
Northeast Indiana	4	3	14	4	0	8	0	1	0	0
Central Indiana	5	11	26	12	1	5	2	6	1	6
West Central Indiana	1	2	14	3	0	1	0	2	0	0
Southwest Indiana	8	6	21	6	0	4	2	12	0	1
Southeast Indiana	5	5	21	5	0	3	3	9	1	1

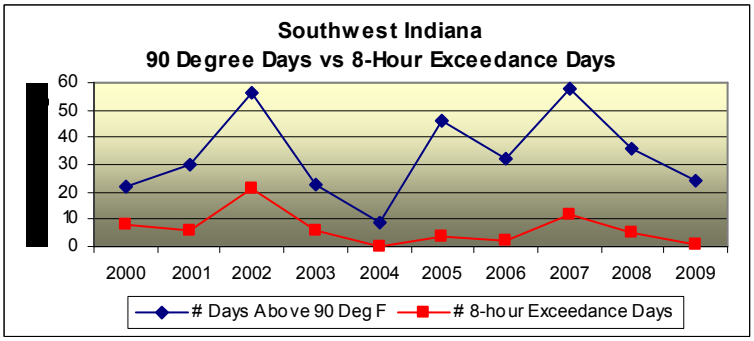


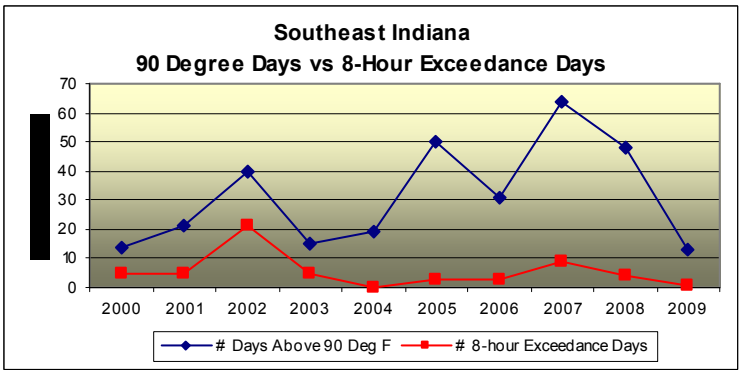












*Total number of days with recorded daily maximum temperatures at or above 90°C.

Ozone Monitors by Area of the State			
Area	**Counties**		
Northwest	Lake	LaPorte	Porter
North Central	Elkhart	St. Joseph	
Northeast	Allen	Huntington	
Central	Boone	Johnson	
	Delaware	Madison	
	Hamilton	Marion	
	Hancock	Morgan	
	Hendricks	Shelby	
West Central	Carroll	Vigo	
Southwest	Greene	Vanderburgh	
	Perry	Warrick	
	Posey		
Southeast	Clark	Jackson	Floyd

Maintenance Plan Trigger Evaluation

	09 4th High	08-09 Avg 4th High	07-09 Avg 4th High	Warning Trigger (W)	Action Trigger (A)	Response Needed
Central Indiana						
Fort Harrison	0.073	0.074	0.077	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
Noblesville	0.071	0.072	0.076	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
Fort Wayne						
Leo	0.065	0.065	0.069	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
South Bend/ Elkhart						
Granger	0.062	0.065	0.071	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
Bristol	0.061	0.064	0.070	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
Clark/Floyd						
Charlestown	0.067	0.071	0.077	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
Evansville						
Inglefield	0.068	0.070	0.076	1Yr.@0.088	2 Yrs.@0.085	W-No A-No
Boonville	0.064	0.067	0.072	1Yr.@0.088	2 Yrs.@0.085	W-No A-No
Greene County						
Plummer	0.068	0.070	0.074	1Yr.@0.088	2 Yrs.@0.085	W-No A-No
Jackson County						
Brownstown	0.063	0.066	0.070	1Yr.@0.088	2 Yrs.@0.085	W-No A-No
LaPorte County						
LaPorte	0.063	0.064	0.068	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
Michigan City	0.066	0.062	0.066	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
Muncie						
Albany	0.068	0.065	0.069	1Yr.@0.088	2 Yrs.@0.085	W-No A-No
Terre Haute						
Sandcut	0.061	0.063	0.066	1Yr.@0.088	2 Yrs.@0.085	W-No A-No
Northwest IN						
Ogden Dunes	0.067	0.068	0.073	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No